REMARKS

The Office Action indicated that Claims 9-10, and 28-29 were allowable if placed in independent form, Applicant requests that the allowance be held in abeyance until consideration of this Office Action.

The Office Action objected to the Title and the Abstract, Applicant has amended the Application to overcome the objection and respectfully requests that the objection be withdrawn.

The Office Action rejected Claim 1 under 35 U.S.C. §112 as being indefinite. Applicant has amended Claim 1 to overcome the rejection and respectfully requests that the rejection be withdrawn.

The present invention reduces a voltage drop caused by the discharge currents in the sustain period T3 to maintain high display quality while using a relatively low amount of current drive power. (Pg. 32, ln 18 – Pg. 33, ln. 8). In the present invention, sustain data pulses applied by a plurality of data circuits 217 to 27m to the data electrodes are applied such that each of the driving circuits 217 to 27m raises rectangular pulses at a different timing. (Pg. 29, lns. 2 – 7; FIG. 5) Thus, the discharge currents E_1, E_2, E_3, and E_4 flowing in the scan electrodes SCN and the sustain electrodes SUS in the sustain period T3 respectively peak at times t_{501}, t_{502}, t_{503}, and t_{504}, which are different from each other. (Pg. 31, lns. 10 – 13, Pg. 31, lns. 19 -20; FIG. 6) The total discharge current Et flowing in the sustain period T_3 observed when driving the PDP apparatus 1 can therefore be reduced. (Pg. 31, ln. 20 – Pg. 32, ln. 2) An inexpensive driving circuit can be used for the PDP apparatus 1 reducing a manufacturing cost of the PDP apparatus 1. (Pg. 33, lns. 3 – 8)

The Office Action rejected Claims 1 and 20 as being anticipated by *Kanazawa* under 35 U.S.C. §102. Applicant has incorporated features of Claims 2 and 21 into Claims 1 and 20

respectively. The Office Action also rejected Claims 2-3 and 21-22 as being unpatentable over *Kanazawa* in view of *Nakamura* (U.S. 5,990,630).

Kanazawa forms negative charges in a scan electrode and a sustain electrode to prevent a false discharge from occurring in an unselected cell. It accomplishes this by initiating a discharge in a cell in which an address is conducted at a first timing T1 in a charge adjustment period and initiating in a second timing T2 a discharge for adjusting a wall charge in a cell where charge remains therein because the address discharge does not occur. (Abstract)

Nakamura disclose a method for controlling an AC PDP which eliminates the unbalance from drivers for data electrodes without increase of peak current. It accomplishes this by changing the order of data pulses. (Col. 4, lns. 48 – 52).

Kanazawa does not disclose "in the sustain period, the driving unit applies the voltage to the plurality of third electrodes such that waveforms of the voltage applied to the plurality of third electrodes differ among the plurality of groups of third electrodes in terms of a rise start timing which is set relative to a time at which the voltage applied to the plurality of pairs of first and second electrodes reaches a predetermined level." The Office Action on Page 5 cites to Column 7, lines 40-67 and FIGS. 3A to 3E of *Kanazawa* for the features of the present invention.

However, as can be seen in FIGS. 3A to 3E, *Kanazawa* discloses various applications of the VcX and VcY waveform. (Col. 7, lns. 40 – 67; FIGS. 3A – 3E). Such waveforms are directed to sustain electrodes X and scan electrodes Y. (Col. 1, lns. 22 – 44) and not the address electrodes. The address electrodes are different from the scan electrodes and the sustain electrodes. (Col. 1, lns. 22 – 26).

Although the address electrodes may receive pulses which different from the pulses given to the sustain and scan electrodes, *Kanazawa* teaches that all of the address electrodes receive the

same pulse at the same time as evidenced by only a single figure for an address electrode. (FIGS. 3A, 4A, 5A, 6A). Unlike the scan or sustain electrodes which may receive different waveforms at different times from its neighboring scan or sustain electrodes, all of the address electrodes in *Kanazawa* receives the same waveform at the same time.

Furthermore, *Nakamura* also does not teach or suggest "in the sustain period, the driving unit applies the voltage to the plurality of third electrodes such that waveforms of the voltage applied to the plurality of third electrodes differ among the plurality of groups of third electrodes in terms of a rise start timing which is set relative to a time at which the voltage applied to the plurality of pairs of first and second electrodes reaches a predetermined level."

While *Nakamura* may disclose two groups of data electrodes DA and DB, there is no indication that it varies the timing of the pulses for each of two groups of data electrodes in the sustain period. As seen in FIG. 8, data electrodes Db1 – Dbn receive pulses that are delayed by Td when compared with data electrodes Da1 - Dam only in the write-in discharge period B and not in the sustain discharge period C in Field 1. In Field 2, Data electrodes Da1 – Dam receive pulses that are delayed by Td when compared with data electrodes Db1 – Dbn only in the write-in discharge period B and not in the sustain discharge period C. (Col. 6, lns. 36 – 48). There is no indication in *Nakamura* that the pulse given to data electrodes Da1 – Dam and data electrodes Db1 – Dbn have timing differences in the sustain discharge period C. (Fig. 9)

In contrast, in the present invention, data driver 27 has M driving circuits 217 to 27m and each of the driving circuits 271 to 27m is connected to a predetermined number of data electrodes D as seen in FIG. 3. (Pg. 25, lns. 8 – 11). As seen in FIG. 5, sustain data pulses 320(1) to 320(n) are respectively applied to data electrodes D1 to Dn in the sustain period. (Pg. 29, lns. 2 – 7). Data electrodes 320(1) to 320(4) form a first group of data electrodes while data

electrodes 320(5) to 320(8) form a second group of data electrodes. The sustain data pulses 320(1) to 320(n) are applied to the data electrodes D1 to Dn in the sustain period T3 in such a manner that each of the driving circuits 217 to 27m raises rectangular pulses at a different timing. Sustain data pulses 320(1) to 320(4) occur at time t11, t12, and t13 while sustain data pulses 320(5) to 320(8) occur at time t51, t52, and t53. (FIG. 5)

Notably t51, t52, and t53 are delayed from t11, t12, and t13 respectively. The sustain data pulses 320(5) to 320(8) in the second group of data electrodes are delayed comparatively to the sustain data pulses 320(1) to 320(4) for the first group of data electrodes. With the different timing of the sustain data pulses, the discharge currents E1, E2, E3, and E4 flowing into the scan electrodes and the sustain electrodes in the sustain period T3 respectively peak at times t_{501}, t_{502}, t_{503}, and t_{504} which are different from each other. (Pg. 31, lns. 10 – 13; FIG. 6)

This difference in peak time for the discharge currents, reduces a total discharge current Et flowing in the sustain period T3 when compared with a conventional PDP apparatus without increasing the number of power sources in the PDP apparatus 1. (Pg. 31, ln. 19 – Pg. 32, ln. 17; FIG. 6) Since a voltage drop caused by the discharge currents in the sustain period T3 an be reduced, high display quality can be maintained. (Pg. 32, lns. 18 – 22)

Our recent discussion with Pinchus Laufer in the Office of Patent Legal Administration, who was involved in writing the Examination Guidelines for Determining Obviousness under 35 USC §103 in view of the Supreme Court decision in *KSR International Co. vs. Teleflex, Inc.* verified that the *KSR* decision still required a specific rationale that could not be based on hindsight for purportedly combining the elements in the prior art to meet an invention defined in the patent claims.

Mr. Laufer incorporated the following from the existing MPEP into the Guidelines.

As noted in the MPEP at §2143.02:

> A rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395 (2007); *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950). (underline added)

As noted above, the *Kanazawa* reference teaches only the function of all of the address electrodes receiving the same waveform at the same time. *Nakamura* teaches a function of delaying pulses to the data electrodes only in the write-in discharge period B and not in the sustain discharge period C.

Any hypothetical combination of these functions based on an uncited teaching reference still would not meet our current claims.

With respect to Claim 20, all arguments for patentability for Claim 1 are repeated and incorporated herein.

The Office Action rejected Claims 4-8, 11-18, 23-27, and 30-38 under 35 U.S.C. § 103(a) as being unpatentable over *Kanazawa* in view of *Chien* (U.S. Patent Pub. No. 2003/0042855).

With respect to Claim 7 *Chien* does not teach or suggest "in the sustain period, a voltage waveform applied to at least one of the plurality of third electrodes starts to fall at a different timing, from a voltage waveform applied to an adjacent third electrode." The Office Action on Page 10 cited to FIG. 7, the Abstract, and Paragraphs 0029 and 0030 of *Chien* for the features of the present invention. However, as seen in FIG. 7, each of the address electrodes Ai receive the same waveform. *Chien* does not distinguish between each address electrode in terms of the

characteristics of the waveform they receive. The adjacent address electrodes in *Chien* all receive the same waveform which all rise and fall at the same time. (FIG. 7; ¶ 0029).

Nakamura also does not teach the features of the present invention. As seen in FIG. 8, each of the waves Pd1 and Pd2 appear to fall at the same time. Even if there is a delay, Td, in the rising of the waveforms, the falling of the waveforms appear to be uniform. There is also no indication that Da1 – Dam are adjacent to Db1 – Dbn and also that such difference in fall times should occur in the sustain discharge period C as opposed to the write-in discharge period B.

Likewise, *Kanazawa* also does not remedy the deficiencies of *Chien* and *Nakamura* since the address electrodes are all provided with the exact same waveform as illustrated by FIG. 3A.

In contrast, in the present invention, data electrode D4 and data electrode D5, which are adjacent to each other have voltage waveforms 320(4) and 320(5) which fall at different times. (FIG. 5)

With respect to Claim 40, neither *Kanazawa*, *Nakamura*, or *Chien* disclose "wherein in the sustain period, a plurality of discharge currents flow through the plurality of pairs of first and second electrodes, the plurality of discharge currents differing in terms of start timing and peak timing."

While the scan and sustain electrodes in *Kanazawa* have pulses with different start times applied to them in the sustain discharge period, there is no indication that the sustain and scan electrodes have discharge currents that differ in start time and peak time. *Kanazawa* does not discuss the characteristics of the discharge currents in the sustain period and more specifically that the discharge currents in the sustain period should be varied.

Likewise there is no indication in *Nakamura* or *Chien* that the plurality of discharge currents in the pairs of first and second electrodes in the sustain period differ in start time or peak time.

In contrast, in the present invention, Each of the driving circuits 271 to 27m applies a set of sustain data pulse 320 at a different timing in the sustain period T3 as presented in FIG. 5. (Pg. 31, lns. 13 – 16; FIG. 6) Thus, the discharge currents E_1, E_2, E_3, and E_4 flowing in the scan electrodes SCN and the sustain electrodes SUS in the sustain period T3 respectively peak at times t_{501}, t_{502}, t_{503}, and t_{504}, which are different from each other. (Pg. 31, lns. 10 – 13, Pg. 31, lns. 19 -20; FIG. 6) The total discharge current Et flowing in the sustain period T_3 observed when driving the PDP apparatus 1 can be reduced. (Pg. 31, ln. 20 – Pg. 32, ln. 2)

Dependent Claims 3-7, 11, 12 – 19, 22 – 27, 30 – 40 depend from and further define Independent Claims 1 and 20 and are thus allowable, too.

If there are any questions with regards to these amendments the undersigned attorney can be contacted at the below listed telephone number.

Very truly yours,

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